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REMARKS

Claims 1-25 were pending, all of which were rejected. Reconsideration is respectfully requested.

Claim Rejections – 35 U.S.C. §102

Claims 1, 5-12, and 16-23 were rejected under 35 U.S.C. §102(e) as being anticipated by Katti et al., (6,707,084) ("Katti"). Applicant respectfully traverses this rejection.

Independent Claim 1 recites "a capping layer structure including a refractory metal layer and a silicon layer, wherein the refractory metal layer is disposed between the free layer structure and the silicon layer."

The Examiner cited Katti stating that Katti discloses "a capping layer structure (416,418) including a refractory metal (tantalum – Col 6, line 60) layer and a silicon layer (CrSi – Col 7, line 3)". Applicant respectfully submits that Katti does not disclose a "silicon layer" as recited in Claim 1. As correctly noted by the Examiner, Katti discloses a combination of chromium and silicon (CrSi), but does not disclose a layer of silicon (Si).

The claimed capping structure in Claim 1 includes a layer of silicon, which is not the same structure disclosed in Katti which includes a layer of CrSi. A capping structure that includes a silicon layer with a refractory metal layer is advantageous as the silicon acts as an active diffusion species to produce a silicide, which causes a large compressive stress. See, paragraph 26 of the present application.

The use of a combination of chromium and silicon (CrSi) as disclosed in Katti will not have the same effect as using a "silicon layer" because the silicon in the chromium silicon (CrSi) combination is bonded to the chromium and generally will not be available to act as an active diffusion species with the refractory metal. It is noteworthy that Katti also discloses the use of "copper (Cu), tantalum (Ta), titanium nitride (TiN), and the like" in place of the CrSi layer 418. See, col. 7, lines 3-6. Thus, according to Katti, the use of CrSi in layer 418 is interchangeable with metals/metal alloys Cu, Ta and TiN, as opposed to being interchangeable with silicon.

Accordingly, the capping structure including a CrSi layer that is disclosed in Katti is significantly different than the capping structure recited in Claim 1, which includes a refractory metal layer and a silicon layer.

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Thus, Applicant respectfully submits that Claim 1 is patentable over Katti. Reconsideration and withdrawal of this rejection is respectfully requested. Claims 5-10 depend from Claim 1 and are, therefore, likewise patentable for at least the same reasons.

Independent Claim 11 recites "a capping layer structure comprising a first capping layer and a second capping layer, the first capping layer located between the second capping layer and the pinned layer structure, the first capping layer interfacing with the second capping layer to form a silicide that provides a compressive stress on the pinned layer structure."

The Examiner cited Katti as discussed above and stated that "the first capping layer interfacing with the second capping layer to form a silicide that provides a compressive stress on the pinned layer structure (inherent)." Applicant respectfully disagrees.

Applicant submits that as discussed above, the use of a combination of chromium and silicon (CrSi) with a refractory metal layer such as tantalum, as disclosed in Katti, will not form a silicide to cause a large compressive stress. The silicon in the chromium silicon (CrSi) combination is bonded to the chromium and generally will not be available to act as an active diffusion species to form "a silicide that provides a compressive stress on the pinned layer structure." Thus, Katti does not disclose explicitly or inherently "a first capping layer and a second capping layer" and "the first capping layer interfacing with the second capping layer to form a silicide that provides a compressive stress on the pinned layer structure."

Thus, Applicant respectfully submits that Claim 11 is patentable over Katti. Reconsideration and withdrawal of this rejection is respectfully requested. Claims 12, 16-20 depend from Claim 11 and are, therefore, likewise patentable for at least the same reasons.

Independent Claim 21 recites "forming a capping layer structure" comprising "forming a first capping layer of a refractory metal" and "forming a second capping layer of silicon on the first capping layer, wherein the first capping layer is located between the pinned layer structure and the second capping layer structure, wherein a silicide is formed at the junction of the first capping layer and the second capping layer."

As discussed above, Katti does not disclose "forming a second capping layer of silicon on the first capping layer" wherein "a silicide is formed at the junction of the first capping layer and the second capping layer."

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Thus, Applicant respectfully submits that Claim 21 is patentable over Katti. Reconsideration and withdrawal of this rejection is respectfully requested. Claims 22-23 depend from Claim 21 and are, therefore, likewise patentable for at least the same reasons.

Claim Rejections – 35 U.S.C. §103

Claims 2, 13, and 24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Katti. Reconsideration is requested.

Claims 2, 13, and 24 depend from Claims 1, 11, and 21, respectively, are, therefore, likewise patentable for at least the same reasons.

Claims 3, 4, 14, 15, and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Katti in view of Schwarz et al. (6,897,532) ("Schwarz"). Reconsideration is requested.

Schwarz fails to make up for the deficiencies of Katti. Claims 3-4, 14-15, and 25, depend from Claims 1, 11, and 21, respectively, are, therefore, likewise patentable for at least the same reasons.

No claims have been amended. For the above reasons, Applicants respectfully request allowance of Claims 1-25. Should the Examiner have any questions concerning this response, the Examiner is invited to call the undersigned at (408) 982-8202.

CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office to the fax number 571-273-8300 on September 18, 2006.

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Date of Signature

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